

Appl. No.: 10/642,490
Amendment dated January 10, 2005
Reply to Office Action of September 9, 2004

REMARKS/ARGUMENTS

The office action of September 9, 2004 has been carefully reviewed and these remarks are responsive thereto. Reconsideration and allowance of the instant application are respectfully requested. Claims 1-3 remain in this application.

Preliminarily, applicants note with appreciation the indication that the application contains allowable subject matter. Specifically, claim 3 has been objected to for being dependent upon a rejected base claim, but would be allowable if amended to incorporate all the features of their ultimate base claim and any intervening claims. Applicants respectfully traverse these rejections.

Claim 1 has been amended to remove the field of use language that was not being given any patentable weight.

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,055,330 to Eleftheriadis et al. ("Eleftheriadis") in view of U.S. patent no. 6,016,158 to Mackinnon and claim 2 has been rejected over this combination and further in view of U.S. patent no. 5,546,461 to Ibaraki et al. ("Ibaraki"). Applicants respectfully traverse these rejections.

Independent claim 1 calls for a method of producing a depth map including, among other steps, identifying and numbering each frame of the video sequence; identifying at least one object within the video sequence; allocating an identifying tag to each object; dividing the video sequence into a plurality of partial sequences; transmitting the partial sequences to a plurality of operators, each operator determining and defining an outline for each object in the partial sequence previously allocated the identifying tag; receiving the partial sequences from the plurality of operators; collating the partial sequences to reform the video sequence; and allocating a depth tag to each object.

The action alleges that Eleftheriadis shows certain elements of claim 1. In particular, the action points to col. 8, lines 52-61 and col. 17, lines 1-20 to the step of identifying at least one object within a video sequence, col. 10, lines 34-45 and line 65 to col. 11, line 23 and col. 18, lines 36-44 to show the step of allocating an identifying tag, and col. 10, lines 13-26 and col. 17, lines 40-52 to show the step of allocating a depth tag. The action acknowledges that Eleftheriadis

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does disclose identifying and number each frame of the video sequence, but takes official notice that identifying and numbering each of a video sequence is well known and contends it would have been obvious to identify and number each frame to ensure that the sequence is properly reconstructed after it has been encoded, transmitted and decoded. Also, the action acknowledges that Eleftheriadis fails to disclose dividing video sequence into a plurality of partial sequences; transmitting the partial sequences to a plurality of operators, each operator determining and defining an outline for each object in the partial sequence previously allocated the identifying tag; receiving the partial sequences from the plurality of operators; and collating the partial sequences to reform the video sequence as recited in claim 1. To overcome these deficiencies, the action relies on Mackinnon.

Contrary to the action's assertion, Eleftheriadis neither teaches nor suggests a method of producing a depth map including the steps of identifying at least one object within a video sequence, allocating an identifying tag, and allocating a depth tag as recited in claim 1. Indeed, Eleftheriadis is wholly unrelated to a method of producing a depth map and merely describes a technique for compressing a video signal. In order to compress the video signal Eleftheriadis needs to know the location of objects within the video image and in order to locate such objects Eleftheriadis requires a depth map. Significantly, Eleftheriadis automatically obtains depth maps from a special "depth camera" 100 that produces a video signal 101 (a conventional 2D video signal) and a depth signal (i.e. depth map). Such cameras are known in the art such as the Z-Cam from the Israeli company 3DV. At col. 9, lines 18-20 Eleftheriadis discloses that such a depth camera automatically generates a depth map: "[t]he array of depth values, or depth map, generated by camera 100 and fed into a 16-bit wide buffer 512 via bus 511." Eleftheriadis discloses nothing more than the camera 100 automatically generating the depth map. In practice, had the original images been recorded with a depth camera as described in Eleftheriadis then there would have been no need to produce a depth map according to the claim 1 invention. Namely, Eleftheriadis fails to teach or suggest method of producing a depth map including the steps of identifying at least one object within a video sequence, allocating an identifying tag, and allocating a depth tag recited in claim 1.

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More specifically, Eleftheriadis discloses a method in which a depth map is actually used rather than a series of steps for producing a depth map. Reference to various locations in Eleftheriadis is instructive. For example, in the Abstract, Eleftheriadis makes reference to receiving depth information and converting depth information. In the description of related art, at col. 2 lines 18-22 Eleftheriadis makes reference to a technique which employs three dimensional depth information. Also, at col. 2 lines 42 and 43 Eleftheriadis makes reference to techniques which utilize three dimensional information retrieved by a stereo imaging camera. Further, at col. 3 lines 18-20, Eleftheriadis states that "there exists a need for a technique which directly utilizes three dimensional shape information." Tellingly, in the Summary of the Invention at col. 3, lines 31-32, Eleftheriadis identifies an object of the invention "to provide a technique which utilizes depth information." Given the depth information Eleftheriadis segments this information to create regions of varying perceptual importance within the frame. Col. 5, lines 40-52. Importantly, Eleftheriadis does not use segmentation to provide a depth map. Instead, given a depth map Eleftheriadis uses segmentation techniques for other purposes. Plainly, Eleftheriadis is directed to creating an improved compression method which uses available depth information rather than producing a depth map as recited in claim 1. Hence, the portions of Eleftheriadis relied on in the action to allegedly show the steps of producing a depth map merely relate to the utilization of depth information and not to producing a depth map.

Even assuming, but not admitting, that Mackinnon could have been combined with Eleftheriadis, Mackinnon does not remedy the defects discussed above with respect to Eleftheriadis. Also, Ibaraki applied in combination with Eleftheriadis and Mackinnon to reject claim 2 does not cure the deficiencies noted with respect to Eleftheriadis. As such, claims 1 and 2 are patentably distinct from the applied art.

New claim 4 is fully supported by the specification and is patentably distinct over the applied art for at least the same reasons as claim 1 and further in view of the advantageous features recited therein. For example, claim 4 calls for a method of converting 2D images in a video sequence into stereoscopic images applying a depth map. Significantly, Eleftheriadis is wholly devoid of a teaching or suggestion of converting 2D images in a video sequence into *stereoscopic* images. Applicants submit that it would not have been obvious how to modify a

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method of for compressing video as disclosed by Eleftheriadis to a method for converting 2D images in a video sequence into *stereoscopic* images as called for in claim 4.

CONCLUSION

It is believed that no fee is required for this submission. If any fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

All rejections having been addressed, applicants respectfully submit that the instant application is in condition for allowance, and respectfully solicit prompt notification of the same.

Respectfully submitted,

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